Practitioner's Docket No. P-1021A **PATENT**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **STEFAN O. DICK, ET. AL.**

Application No.: **10 / 787,422** Group No.: **2859**
Filed: **FEBRUARY 26, 2004** Examiner: **TRAVIS M. REIS**
For: **IRREVERSIBLE HUMIDITY INDICATOR CARDS**
Confirmation No.: 4744

☐ *Patent No.: Issue Date:
Reexamination No.:

*NOTE: *Preferably also insert inventor's name and invention title.*

Assistant Commissioner for Patents
Washington, D.C. 20231

TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION (37 C.F.R. § 1.321(c))

Identification of Person(s) Making This Disclaimer

I, Scott R. Cox
(type or print names of all inventors or assigns or name of attorney signing disclaimer)

(a) represent that I am

☐ an inventor (applicant) of this invention.

☐ an assignee of this invention.

CERTIFICATION UNDER 37 C.F.R. §§ 1.8(a) and 1.10*
*(When using Express Mail, the Express Mail label number is **mandatory**; Express Mail certification is optional.)*

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

☑ deposited with the United States Postal Service in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231

37 C.F.R. § 1.8(a)

☑ with sufficient postage as first class mail.

37 C.F.R. § 1.10 *

☐ as "Express Mail Post Office to Addressee"
Mailing Label No. _____ **(mandatory)**

TRANSMISSION

☐ facsimile transmitted to the Patent and Trademark Office, (703) _____-_____

Holly Hart
Signature

Date: August 13, 2004

Holly Hart
(type or print name of person certifying)

08/17/2004 SSITHIB1 00000014 10787422
01 FC:1814 110.00 OP

* *Only the date of filing (§ 1.6) will be the date used in a patent term adjustment calculation, although the date on any certificate of mailing or transmission under § 1.8 continues to be taken into account in determining timeliness. See § 1.703(f). Consider "Express Mail Post Office to Addressee" (§ 1.10) or facsimile transmission (§ 1.6(d)) for the reply to be accorded the earliest possible filing date for patent term adjustment calculations.*

WARNING: *"If the patent or patent application is assigned to an organization, such as a corporation, partnership, university, [g]overnment agency or similar entity, and the disclaimer is signed by the assignee, the assignee must comply with § 3.73(b)." Notice of Oct. 15, 1993, 1156 O.G. 54-61 at 56, § 1490, M.P.E.P., 7th Edition.*

☐ a representative authorized to sign on behalf of the assignee identified below.

☐ A statement under 37 C.F.R. § 3.73(b) is attached.

WARNING: *See the above "WARNING."*

☑ the attorney of record for this invention.

NOTE: The rules "permit an attorney or agent of record to sign a terminal disclaimer without the need to comply with § 3.73(b)." Notice of Oct. 15, 1993, 1156 O.G. 54-61, at 56. See also § 1490, M.P.E.P., 7th Edition.

IDENTITY OF ASSIGNEE AND TITLE OF DISCLAIMANT

(if applicable)

The assignee is

Name of assignee Sud-Chemie Performance Packaging, Inc.

Address of assignee 101 Christine Drive, Rio Grande Industrial Park

Belen, New Mexico 87002

Title of disclaimant authorized to sign on behalf of assignee _____

EXTENT OF DISCLAIMANT'S INTEREST

The extent of the interest in this invention that the disclaimant owns is:

☑ the whole of this invention.

☐ a sectional interest in this invention, as follows:

NOTE: Disclaimers from the whole interest must be filed.

(state the exact interest of the disclaimant)

The disclaimant(s) is/are:

☑ the applicant(s)

☐ the assignee(s)

RECORDAL OF ASSIGNMENT IN PTO
(if applicable)

☐ The assignment was recorded on _____

Reel _____

Frame _____

☐ Authorization for recordal of the assignment is separately attached.

☐ A separate ☐ "ASSIGNMENT (DOCUMENT) COVER SHEET" or
☐ FORM PTO 1595 is also attached.

ESTABLISHING RIGHT OF ASSIGNEE TO TAKE ACTION
(if applicable)

☐ Attached is a STATEMENT UNDER 37 C.F.R. § 3.73(b) establishing the right of the assignee to take action in this case.

NOTE: Insert the appropriate page 3.

DISCLAIMER
(Obviousness-Type Double Patenting Rejection Over A Prior Patent)

Petitioner(s) hereby disclaims, except as provided below, the terminal part of any patent granted on the instant application, which would extend beyond the expiration date of Patent No. 6,698,378 as presently shortened by any terminal disclaimer. Petitioner(s) hereby agree(s) that any patent so granted on the instant application shall be enforceable only for and during such period that it and the above-listed patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors, or assigns.

In making the above disclaimer, disclaimant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. §§ 154 to 156 and 173 of the patent forming the basis of the double patenting rejection, namely, Patent No.: 6,698,378, as presently shortened by any terminal disclaimer, in the event that it later: expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or terminally disclaimed under 37 C.F.R. § 1.321, has all claims cancelled by a reexamination certificate, is reissued, or is in any manner terminated prior to expiration of its full statutory term as presently shortened by any terminal disclaimer, except for the separation of legal title stated above.

DISCLAIMER FEE (37 C.F.R. § 1.20(d))

- ☑ Other than a small entity — fee $110.00
- ☐ Small entity — fee $55.00
  - ☐ Small entity statement attached
  - ☐ Small entity statement already filed
    - ☐ in patent application ____ / _____

      on _____ *(Date)*

FEE PAYMENT

☐ Fee already paid.

☑ Attached is a ☑ check ☐ money order in the amount of $ 110.00

☑ Authorization is hereby made to charge the amount of $

☑ to Deposit Account No. 03-3420

☐ to Credit card as shown on the attached credit card information authorization form PTO-2038.

WARNING: *Credit card information should* ***not*** *be included on this form as it may become public.*

☑ Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

Date: August 13, 2004

Signature of disclaimant

SIGNATURE OF PRACTITIONER OF RECORD

Reg. No.: 31,945

Scott R. Cox

(type or print name of practitioner)

Customer No.:

400 West Market Street, Ste. 2200

P.O. Address

Louisville, Kentucky 40202

The Condensed Chemical Dictionary

TENTH EDITION

Revised by

GESSNER G. HAWLEY

VNR VAN NOSTRAND REINHOLD COMPANY

hydrogenation of primary alcohols yields the group of compounds called aldehydes (q.v.). It is considered to be a form of oxidation, as two hydrogen atoms, each of which contains an electron, have been removed, as in the reaction $CH_3CH_2OH \longrightarrow CH_3CH = O + H_2$.

11 - dehydro - 17 - hydroxycorticosterone. See cortisone.

dehydroisoandrosterone (dehydroepiandrosterone) $C_{19}H_{28}O_2$. An androgenic steroid; a metabolic product of the adrenal steroid hormones, with about one-third of the androgenic activity of androsterone (q.v.).
Properties: Dimorphous: Needles with m.p. 140–141°C; leaflets with m.p. 152–153°C; precipitated by digitonin; soluble in benzene, alcohol, and ether. Sparingly soluble in chloroform and petroleum ether. Also available as the acetate salt.
Derivation: Isolated from male urine; synthesis from cholesterol or sitosterol.
Uses: Medicine; biochemical research.

"Dehydrol."[141] Trademark for dehydrated castor oil used as a drying oil in the manufacture of varnishes and alkyd resins.

dehydrothio-para-toluidine

$CH_3C_6H_3SC(C_6H_4NH_2)N$.
Properties: Long, yellowish iridescent needles. Solutions have a violet-blue fluorescence. M.p. 191°C; b.p. 434°C. Soluble in alcohol; very slightly soluble in water.
Derivation: By heating para-toluidine and primuline base with sulfur and separation from the primuline base by distillation in vacuo.
Uses: Dyestuffs; intermediate.

deicing compound. See calcium chloride; sodium chloride; alcohol.

de-inking. The removal of printing inks from paper by use of strong alkaline solutions such as soda-ash liquor, caustic soda or lime which dissolve varnish and free the ink carbon. Removal of the carbon is accomplished by use of colloidal agents such as talc or bentonite and by mechanical agitation with water.

"Dekatyl."[28] Trademark for a series of dyes for dyeing and printing 65% "Dacron" polyester fiber and 35% cotton.

deKhotinsky cement. A thermoplastic adhesive mixture of shellac and pine tar. It is not attacked by water, sulfuric acid, nitric acid, hydrochloric acid, carbon disulfide, benzene, gasoline, or turpentine; very little affected by ether, chloroform, alkalies, but readily dissolved by ethyl alcohol.

"Delac."[248] Trademark for a series of delayed action rubber accelerators.

"Delactol."[503] Trademark for a vegetable oil solution of vitamin D_2; used in dairy products.

delhi hard. A ferrous alloy (sp. gr. 7.75; m.p. 1500°C) containing in addition to iron 16.5 to 18% chromium, 1 to 1.1% carbon, 0.75 to 1% silicon, 0.35 to 0.5% manganese. It is resistant to cold ammonium hydroxide in all concentrations, and to mine and sea waters and moist sulfurous atmospheres.

deliquescent. Tending to absorb atmospheric water vapor and become liquid. The term refers specifically to water-soluble chemical salts in the form of powders, which dissolve in the water absorbed from the air. Such salts should be kept closely stoppered or otherwise enclosed. See also hygroscopic.

"Delnav."[266] Trademark for dioxathion (q.v.).

"Delrin."[28] Trademark for a type of acetal resin. White and colors available. Also supplied as pipe and fittings. Thermoplastic.
Containers: 50-lb bags; pipe in 20-ft lengths, or coils of 500 ft.
Uses: Injection-molded and extruded parts, door handles, bushings, other mechanical items; underground pipe; automotive parts.

"Delsan."[28] Trademark for fungicide-insecticide seed treatment containing 60% thiram and 15% dieldrin.
Hazard: Toxic by ingestion and inhalation.

delta acid. See Casella's Acid F.

"Deltyl."[227] Trademark for a mixture of isopropyl esters of lauric, myristic and palmitic acids. "Deltyl Extra" is predominantly isopropyl myristate; "Deltyl Prime," isopropyl palmitate.
Uses: Replaces vegetable or mineral oils in cosmetics; emollient and auxiliary emulsifying agent.

delustrant. A substance used to produce dull surfaces on a textile fabric; chiefly used are barium sulfate, clays, chalk, etc. They are applied in the finishing coat.

"Demerol" Hydrochloride.[162] Trademark for meperidine hydrochloride (q.v.).

demethylchlortetracycline hydrochloride
$C_{21}H_{21}ClN_2O_8 \cdot HCl$.
Properties: Yellow crystalline powder; odorless and has a bitter taste. Partially soluble in water and slightly soluble in alcohol.
Grade: N.F.
Use: Medicine (antibiotic).

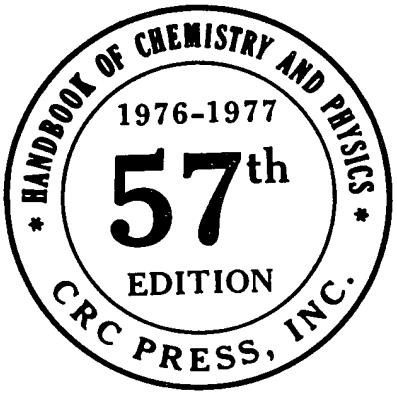
demeton. Generic name for a mixture of O,O-diethyl O-2-(ethylthio)-ethyl phosphorothioate (demeton-O), and O,O-diethyl S-2-(ethylthio)ethyl phosphorothioate (demeton-S). $C_8H_{19}O_3PS_2$.
Properties (of mixture): Pale yellow liquid; b.p. 134°C; (2 mm); sp. gr. 1.118. Slightly soluble in water; soluble in most organic solvents.
Hazard: Highly toxic; absorbed by skin; cholin-

Handbook

OF

Chemistry and Physics

A Ready-Reference Book of Chemical and Physical Data



EDITOR

ROBERT C. WEAST, Ph.D.

Vice President, Research, Consolidated Natural Gas Service Company, Inc.
Formerly Professor of Chemistry at Case Institute of Technology

In collaboration with a large number of professional chemists and physicists whose assistance is acknowledged in the list of general collaborators and in connection with the particular tables or sections involved.

Published by

CRC PRESS

18901 Cranwood Parkway · Cleveland, Ohio 44128

SYMBOLS AND ABBREVIATIONS

[α]	specific rotation
δ	slightly
>	above, more than
<	below, less than
∞	soluble in all proportions
*	name approved by the International Union of Chemists (I.U.C.)[1]
Ω	IR, or UV, or NMR spectra referenced
?	unknown
aa	acetic acid
abs	absolute
ac	acid
Ac	acetyl
ace	acetone
al	alcohol[2]
alk	alkali
Am	J. Am. Chem. Soc.
Am	amyl (pentyl)
amor	amorphous
anh	anhydrous
aqu	aqueous
as	asymmetric
atm	atmospheres
b	boiling
B	Beilstein
Ber	Chem. Ber.
bipym	bipyramidal
bk	black[3]
bl	blue[3]
br	brown[3]
bt	bright
Bu	butyl
bz	Benzene
C	Chem. Abs.
c	percentage concentration
ca	about (circa)
chl	chloroform
co	columns
col	colorless
con	concentrated
cor	corrected
cr	crystals
cy	cyclohexane
d	decomposes
D	line in the spectrum of sodium (subscript)
D, d	dextro[4]
δd	slight decomposition
dil	diluted
diox	dioxane
distb	distillable
dk	dark
Dl, dl	racemic[4]
dlq	deliquescent
DMF	dimethyl formamide
E	Elsevier's
eff	efflorescent
Et	ethyl
eth	ether[5]
exp	explodes
extrap	extrapolated
fl	flakes
flr	fluorescent
fr	freezes
fr. p.	freezing point
fum	fuming
gel	gelatinous
gl	glacial
gold	golden
gr	green[3]
gran	granular
gy	gray[3]
h	hot
H	Helv. Chim. Acta
hex	hexagonal
hp	heptane
htng	heating
hx	hexane
hyd	hydrate
hyg	hygroscopic
i	insoluble
i-	iso-
ign	ignites
in	inactive
inflam	inflammable
infus	infusible
irid	iridescent
iso	isooctane
J	J. Chem. Soc.
JOC	J. Org. Chem.
L, l	levo[4]
la	large
lf	leaf
lig	ligroin
liq	liquid
lo	long
lt	light
m	melting
m-	meta-
M	molar (concentration)
M	Merck Index, 7th Edition
mcl	monoclinic
Me	methyl
met	metallic
micr	microscopic
min	mineral
mod	modification
mut	mutarotatory
n	normal chain, refractive index
N	normal (concentration)
N	nitrogen[6]
nd	needles
o-	ortho-
oct	octahedral
og	orange[3]
oos	ordinary organic solvents
or	or
ord	ordinary
org	organic
orh	orthorhombic
os	organic solvents
p-	para-
pa	pale
par	partial
peth	petroleum ether
pk	pink[3]
Ph	phenyl
pl	plates
pr	prisms
Pr	propyl
Prak	J. Prak. Chem.
purp	purple[3]
pw	powder
Py	pyrimidene
pym	pyramids
rac	racemic
rect	rectangular
red	red
res	resinous
rh	rhombic
rhd	rhombohedral
s	soluble
s	secondary[7]
sc	scales
sec	secondary[7]
sf	softens
sh	shoulder
silv	silvery
sl	slightly (*δ*)
so	solid
sol	solution
solv	solvent
sph	sphenoidal
st	stable
sub	sublimes
suc	supercooled
sulf	sulfuric acid
sym	symmetrical
syr	syrup
t	tertiary[7]
ta	tablets
tcl	triclinic
tert	tertiary[7]
Tet	Tetrahedron
tetr	tetragonal
THF	tetrahydrofuran
to	toluene
tr	transparent
trg	trigonal
undil	undiluted
uns	unsymmetrical
unst	unstable
v	very
vac	vacuum
var	variable
vap	vapor
vic	vicinal
visc	viscous
volat	volatile or volatilises
vt	violet[3]
w	water
wh	white[3]
wr	warm
wx	waxy
ye	yellow[3]
xyl	xylene

1 For I.U.C. rules of nomenclature see General Index.
2 Generally means ethyl alcohol.
3 The abbreviation of a color ending in "sh" is to be read as ending with the suffix "-ish," *e.g.*, grsh means greenish.
4 *D, L* generally mean configuration and *d, l* generally mean optical rotation, but there are many examples in the chemical literature for which the meaning of these symbols is ambiguous and/or interchangeable.
5 Generally means diethyl ether.
6 *N* indicates a position in the molecule.
7 *s* and *sec*, or *t* and *tert*, are used as convenient.

No.	Name	Synonyms and Formula	Mol. wt.	Color, crystalline form, specific rotation and λ_{max} (log ε)	m.p. °C	b.p. °C	Density	n_D	Solubility: w	al	eth	ace	bz	other solvents	Ref.
	Dodecane*														
d291	—,**1,12-dibromo-***	$BrCH_2(CH_2)_{10}CH_2Br$	328.14	nd (aa, al)	41	215^{15}			i	v	s	...	...	chl v aa s	B1², 543
d292	—,**1-iodo-***	$CH_3(CH_2)_{11}I$	296.24		0.3	298.2^{760} 153^{10}	1.1999_4^{20}	1.4840^{20}	i	s ∝ᵏ	∞	∝	...	chl, CCl_4 ∞ MeOH s	B1¹, 67
Ω d293	**Dodecanedioic acid**, dimethyl ester*	$CH_3O_2C(CH_2)_{10}CO_2CH_3$	258.36	pr	31.3	$167–9^9$ 150^2			i	...	...	...	...	AcOEt sᵏ	B2³, 1844
Ω d294	**1-Dodecanethiol***	Dodecyl mercaptan. Lauryl mercaptan. $CH_3(CH_2)_{11}SH$	202.41			$142–5^{15}$	0.8450_0^{20}	1.4589^{20}	i	s	s	...	...		B1³, 1789
Ω d295	**Dodecanoic acid***	Lauric acid. Undecane-1-carboxylic acid. $CH_3(CH_2)_{10}CO_2H$	200.33	nd (al)	44	131^1	0.8679_4^{50}	1.4304^{50}	i	v	v	s	∝ᵏ v	peth s MeOH v	B2³, 868
d296	—,**amide***	Lauramide. $CH_3(CH_2)_{10}CONH_2$	199.34	nd	110	199^{12}		1.4287^{110}	i	s	δ	s	δ	CCl_4 sᵏ	B2³, 894
d297	—,—,*N*-phenyl-	Lauranilide. $CH_3(CH_2)_{10}CONHC_6H_5$	275.44	nd (dil al) λ^{cy} 241 (4.19)	78				i	s	s	s	s	CCl_4, chl s	B12², 148
d298	—,**anhydride***	Lauric anhydride. $[CH_3(CH_2)_{10}CO]_2O$	382.64	lf (al or eth)	41.8	166	0.8533_4^{70}	1.4292^{70}	d	sᵏ	...	...	...		B2², 321
d299	—,**benzyl ester***	Benzyl laurate. $CH_3(CH_2)_{10}CO_2CH_2C_6H_5$	290.45		8.5	$209–11^{12}$	0.9457_{25}^{25}	1.4812^{24}	i	s	v	...	v	chl v peth s	B6², 417
Ω d300	—,**chloride**	Lauryl chloride. $CH_3(CH_2)_{10}COCl$	218.77		−17	145^{18}		1.4458^{20}	d	d	s	...	...		B2², 321
Ω d301	—,**ethyl ester***	Ethyl laurate. $CH_3(CH_2)_{10}CO_2C_2H_5$	228.38		fr. −1.8	273^{764} 154^{15}	0.8618_4^{20}	1.4311^{20}	i	v	∞	...	...		B2³, 884
d302	—,**isopropyl ester***	Isopropyl laurate. $CH_3(CH_2)_{10}CO_2C_3H_7^i$	242.41			196^{60} 117.4^2	0.8536^{20}	1.4280^{25}	...	s	v	...	...		B2³, 886
Ω d303	—,**methyl ester***	Methyl laurate. $CH_3(CH_2)_{10}CO_2CH_3$	214.35		fr. 5.2	262^{766} 141^{15}	0.8702_4^{20}	1.4319^{20}	i	∞	∞	∞	∞	MeOH, chl, CCl_4, AcOEt s	B2³, 883
Ω d304	—,**nitrile**	Lauronitrile. Undecyl cyanide. $CH_3(CH_2)_{10}CN$	181.33		fr. 4	277^{760} 131^{10}	0.8240_4^{20}	1.4361^{20}	i	∞	∞	∞	∞	chl ∞	B2³, 895
d305	—,**phenyl ester***	Phenyl laurate. $CH_3(CH_2)_{10}CO_2C_6H_5$	276.42	lf (al)	24.5	210^{15}			i	s	s	s	...		B6, 154
d306	—,**4-phenylphenacyl ester.**		394.56		86				i	...	...	...	...		C32, 4943
d307	—,**piperazinium salt**	$C_4H_{10}N_2 \cdot 2CH_3(CH_2)_{10}CO_2H$	486.79		92–2.5				s	s	i	...	...		Am 70, 2758
d308	—,**propyl ester***	Propyl laurate. $CH_3(CH_2)_{10}CO_2CH_2CH_2CH_3$	242.31			205^{60} 124^2	0.8600^{20}	1.4335^{20}	...	...	...	...	...		B2², 885
d309	—,**2-bromo-***	$CH_3(CH_2)_9CHBrCO_2H$	279.23	pl	32	$157–9^2$	1.1474^{24}	1.4585^{24}	i	v	s	...	v	chl, lig s	B2, 363
d310	—,**12-fluoro-***	$F(CH_2)_{11}CO_2H$	218.32		60–1				i	v	v	...	...	lig sʰ	C51, 7300
Ω d311	**1-Dodecanol***	Lauryl alcohol. $CH_3(CH_2)_{11}OH$	186.32	lf (dil al)	26 (22)	$255–9^{760}$ 150^{20}	0.8309_4^{24}		i	s	s	...	...		B1², 463
d312	**6-Dodecanol***	$CH_3(CH_2)_4CHOH(CH_2)_5CH_3$	186.34	(peth)	30	119^9			i	s	s	...	...		B1, 428
Ω d313	**2-Dodecanone***	*n*-Decyl methyl ketone. $CH_3CO(CH_2)_9CH_3$	184.33		21	$246–7^{760}$ 144^{11}	0.8198_4^{30}	1.4330^{20}	i	s	s	s	...	os s	B1², 769
Ω d314	**1-Dodecanone, 1-phenyl-***	Laurophenone. Lauroylbenzene. *n*-Undecyl phenyl ketone. $CH_3(CH_2)_{10}COC_6H_5$	260.43	og cr	46–7	$222–3^{21}$ 187^5	0.8969_4^{52}	1.4850^{52}	i	...	...	s	...		B7¹, 186
—	**1,6,10-Dodecatrien-3-ol, 3,7,11-trimethyl-***	*see* **Nerolidol**													
Ω d315	**1-Dodecene***	α-Dodecylene. $CH_3(CH_2)_9CH{:}CH_2$	168.33		−35.23	213.4^{760} 88.7^{10}	0.7584_4^{20}	1.4300^{20}	i	s	s	s	...	peth s	B1³, 869
d316	**2-Dodecenedioic acid(*cis*)***	Traumatic acid. $HO_2CCH{:}CH(CH_2)_8CO_2H$	228.29	(al, ace)	67–8				δ	s	s	...	s	chl s	B2³, 1978
d317	—(*trans*)*	$HO_2CCH{:}CH(CH_2)_8CO_2H$	228.29	(al, ace)	165–6				δ	s	s	...	...	chl s	B2³, 1979
d318	**1-Dodecen-3-yne***	$CH_2{:}CHC{:}C(CH_2)_7CH_3$	164.29			78^4	0.7858_4^{25}	1.4510^{25}	...	...	...	...	...		B1³, 1055
d319	**1-Dodecyne***	$CH{:}C(CH_2)_9CH_3$	166.31		−19	215^{760} 89^{10}	0.7788_4^{20}	1.4340^{20}	...	...	...	...	...		B1³, 1024
d320	**2-Dodecyne***	$CH_3C{:}C(CH_2)_8CH_3$	166.31		−9	105^{15}	0.7917_4^{15}	1.4828^{20}	i	...	s	s	...		B1³, 1025
d321	**3-Dodecyne***	$CH_3CH_2C{:}C(CH_2)_7CH_3$	166.31			95^{12}	0.7871_4^{20}	1.4442^{20}	i	...	s	s	...		B1³, 1025
d322	**6-Dodecyne***	Di *n*-amylacetylene. $CH_3(CH_2)_4C{:}C(CH_2)_4CH_3$	166.31			209^{745} 100^{14}	0.7871_4^{20}	1.4442^{20}	i	s	s	s	...		B1³, 1025
Ω d323	**Dotriacontane***	Dicetyl. $CH_3(CH_2)_{30}CH_3$	450.89	pl (bz, chl, aa, eth)	69.7	467^{760} 292.7^{10}	0.8124_4^{20} suc	1.4550^{20}	i	δ	sᵏ	...	vᵏ δ	CCl_4, aa sᵏ chl δ, CS_2 s	B1³, 587
d324	**1-Dotriacontanol***	$CH_3(CH_2)_{30}CH_2OH$	466.89	pl (bz)	89.4	sub $200–50^1$			i	...	...	...	...		B1³, 1851
—	**Dulcitol**	*see* **Galactitol**													
—	**Durene**	*see* **Benzene, 1,2,4,5-tetramethyl-**													
—	**Durenol**	*see* **Benzene, 1-hydroxy-2,3,5,6-tetramethyl-**													
—	**Durohydroquinone**	*see* **Benzene, 1,4-dihydroxy-2,3,5,6-tetramethyl-**													

For explanations, symbols and abbreviations see beginning of table. For structural formulas see end of table.

No.	Name	Synonyms and Formula	Mol. wt.	Color, crystalline form, specific rotation and λ_{max} (log ε)	m.p. °C	b.p. °C	Density	n_D	Solubility: w	al	eth	ace	bz	other solvents	Ref.
	Naphthalene														
Ω n174	—,1,5-dinitro-*	$C_{10}H_6N_2O_4$. *See* n14	218.17	hex nd (aa or ace) λ^{al} 233 (4.32), 327 (3.81)	219	sub			i	δ	v	δ	s[h]	Py s[h], CS_2 δ	**B5**[3], 1606
Ω n175	—,1,8-dinitro-*	$C_{10}H_6N_2O_4$. *See* n14	218.17	ye rh pl (chl) λ^{al} 231 (4.44), 313 (3.81)	173–3.5	445d			i	δ	...	s	δ	Py s chl δ	**B5**[3], 1607; **B14**[2], 653
n176	—,1,6-dinitro-2-hydroxy-*	$C_{10}H_6N_2O_5$. *See* n14	234.17	pa ye nd (chl)	195d				i	s[h]	v	...	...	Py, chl v lig i	**E12B**, 1581
n177	—,2,4-dinitro-1-triazo-*	$C_{10}H_5N_5O_4$. *See* n14	259.18	ye rh nd (al)	105d				...	s[h]	s	...	s	chl, to s lig s[h]	**B5**[2], 460
n178	—,5,8-dioxo-1,4,5,8,9,10-hexahydro-1,4-methylene-*	Cyclopentadienebenzoquinone.	174.20	gr-ye lf (MeOH) λ 285 (1.40)	77–8				...	s	s	s	s	o s s	**E13**, 1033
Ω n179	—,1-ethoxy-*	Ethyl α-naphthyl ether. $C_{12}H_{12}O$. *See* n14	172.23	nd	5.5	280.5	1.060_4^{20}	1.5953^{25}	i	v	v	...	...	.....	**B6**[3], 2924
Ω n180	—,2-ethoxy-*	Ethyl β-naphthyl ether Nerolin II. $C_{12}H_{12}O$. *See* n14	172.23	pl (al)	37–8	136–8[14] 282	1.0640_{20}^{20}	1.5975^{36}	i	s	s	...	...	to, lig, CS_2, s	**B6**[3], 2972
Ω n181	—,1-ethyl-*	$C_{12}H_{12}$. *See* n14	156.23	λ^{iso} 224 (4.9), 282 (3.8), 323 (1.4)	−13.88	258.67[760]	1.00816_4^{20}	1.6062^{20}	i	∞	∞	...	...	.....	**B5**[3], 1639
Ω n182	—,2-ethyl-*	$C_{12}H_{12}$. *See* n14	156.23	.....	−7.4	120[10] 257.9[760]	0.9922_4^{20}	1.5999^{20}	i	∞	∞	...	...	.....	**B5**[3], 1641
n183	—,1(ethylamino)-*	Ethyl α-naphthylamine. $C_{12}H_{13}N$. *See* n14	171.25	.....	.....	119[10] 303[723]	1.060^{20}	1.6477^{15}	i	s	s	...	...	.....	**B12**[2], 682
n184	—,2(ethylamino)-*	Ethyl β-naphthylamine. $C_{12}H_{13}N$. *See* n14.	171.25	.....	<15	191[16] 316–7	1.0545^{21}	1.6544^{21}	...	...	...	...	...	.....	**B12**[2], 715
Ω n185	—,1-fluoro-*	$C_{10}H_7F$. *See* n14.	146.17	.....	−9	191[25] 215[750] 80[11]	1.1322^{20}	1.5939^{20}	i	s	s	...	s	chl, aa s	**B5**[3], 1569
Ω n186	—,2-fluoro-*	$C_{10}H_7F$. *See* n14.	146.17	nd (al)	61	211.5[737] 90[16] sub			i	s	s	...	s	chl, aa s	**B5**[3], 1569
n187	—,1(formylamino)-*	$C_{11}H_9NO$. *See* n14.	171.20	nd (w)	137.5				s[h]	s	s	s	...	o s s	**E12B**, 459
n188	—,2(formylamino)-*	$C_{11}H_9NO$. *See* n14.	171.20	lf (bz-peth)	129				...	s	...	...	s	peth δ	**E12B**, 562
n189	—,1,2,3,4,9,10-hexahydro-*	Naphthalene hexahydride. $C_{10}H_{14}$. *See* n14	134.22	.....	.....	200 82[2]	0.934[23]	1.5260^{16}	...	...	s	...	s	.....	**B5**, 433
Ω n190	—,1-hydroxy-*	1-Naphthol. α-Naphthol. $C_{10}H_8O$. *See* n14	144.19	ye mcl nd (w) λ^{al} 292 (3.67), 308 (3.52), 322 (3.31)	96 (94)	288[760] sub	1.0989_4^{99}	1.6224^{99}	i δ[h]	v	v	s	s	chl v CCl_4 δ	**E12B**, 1148
Ω n191	—,2-hydroxy-*	2-Naphthol. β-Naphthol. $C_{10}H_8O$. *See* n14	144.19	mcl lf (w), pl (CS_2) λ^{al} 226 (4.86), 265 (3.59), 274 (3.67), 285 (3.52)	123–4	295[760]	1.28^{20}	.....	i δ[h]	v	v	...	s	chl s SO_2, CCl_4 δ lig δ[h]	**E12B**, 1210
n192	—,—,acetate	2-Acetoxynaphthalene. $C_{12}H_{10}O_2$. *See* n14	186.21	nd (al)	71–2	132–4[2]	.....	.....	i	v	v	...	...	chl v	**E12B**, 1256
Ω n193	—,—,benzoate	2-Benzoyloxynaphthalene. $C_{17}H_{12}O_2$. *See* n14	248.29	nd or pr (al), cr (lig) λ^{al} 221 (4.88), 274 (3.71), 303 (2.59), 317 (2.50)	108	.....	.....	.....	i	v[h]	δ	...	...	.....	**E12B**, 1260
Ω n197	—,2-hydroxy-1-methyl-*	1-Methyl-2-naphthol. $C_{11}H_{10}O$. *See* n14	158.20	nd (w, bz-lig, dil aa)	112	180[12] sub	.....	.....	δ s[h]	v	v	v	v	aa, chl v peth s	**E12B**, 1388
n198	—,1-hydroxy-8-nitro-*	8-Nitro-1-naphthol. $C_{10}H_7NO_3$. *See* n14	189.17	grsh ye nd (al, chl, bz-hx)	130–3	.....	.....	.....	s	v	v	v	v	alk s	**E12B**, 1547
Ω n199	—,2-hydroxy-1-nitro-*	1-Nitro-2-naphthol. $C_{10}H_7NO_3$. *See* n14	189.17	ye nd, lf or pr (al) λ^{al} 330 (3.50)	104	115[0.05]	.....	.....	s[h]	s	v	...	...	.....	**E12B**, 1547
n199[2]	—,2-hydroxy-5-nitro	5-Nitro-2-naphthol. $C_{10}H_7NO_3$. *See* n14	189.17	lt ye nd (w)	147–9	.....	.....	.....	v[h]	δ	v	v	...	o o s v	**E12B**, 1556
n201	—,1-hydroxy-4-nitroso-*	1,4-Naphthoquinone 1-oxime*. 4-Nitroso-1-naphthol. $C_{10}H_7NO_2$. *See* n14	173.17	pa ye nd (bz), nd (dil al) λ^{al} 263 (4.08), 372.5 (3.70)	198	.....	.....	.....	i	v	v	v	δ[h]	MeOH v chl, CS_2 δ	**E12B**, 2786
Ω n202	—,2-hydroxy-1-nitroso-*	1,2-Naphthoquinone 1-oxime*. 1-Nitroso-2-naphthol. $C_{10}H_7NO_2$. *See* n14	173.17	ye nd (bz), og pr or pl (al) $\lambda^{w,pH=7}$ 260 (3.78)	112 (109.5)	.....	.....	.....	i	s v[h]	v	s	v	aa v lig δ	**E12B**, 2731
n203	—,2-hydroxy-1,3,6-tribromo-*	1,3,6-Tribromo-2-naphthol. $C_{10}H_5Br_3O$. *See* n14	380.88	nd (aa or al)	133	.....	.....	.....	...	s	...	...	s	MeOH, CCl_4 s	**B6**[3], 3000
n204	—,2-hydroxy-1,4,6-tribromo-*	Providoform. 1,4,6-Tribromo-2-naphthol. $C_{10}H_5Br_3O$. *See* n14	380.88	nd (bz)	157–8	.....	.....	.....	...	s	...	...	s[h]	chl, aa s	**E12B**, 1522

For explanations, symbols and abbreviations see beginning of table. For structural formulas see end of table.

No.	Name	Synonyms and Formula	Mol. wt.	Color, crystalline form, specific rotation and λ_{max} (log ε)	m.p. °C	b.p. °C	Density	n_D	Solubility						Ref.
									w	al	eth	ace	bz	other solvents	
	Succinic acid														
s250[1]	—,**mercapto-**(*d*)	*d*-Thiomalic acid. $HO_2CCH_2CH(SH)CO_2H$	150.15	cr (AcOEt-bz) $[\alpha]_D^{17}$ +64.4 (al), +76.1 (ace)	154	.....	.....	.....	s	s	...	s	...	.....	**B3[2]**, 287
Ω s250[4]	—,—(*dl*)	$HO_2CCH_2CH(SH)CO_2H$	150.15	cr (eth)	151	.....	.....	.....	v	v	s	v	i	.....	**B3[2]**, 291
s250[3]	—,—(*l*)	$HO_2CCH_2CH(SH)CO_2H$	150.15	$[\alpha]_D^{17}$ −64.8 (al), −75.8 (ace)	152–3	.....	.....	.....	s	s	δ	s	δ	.....	**B3[2]**, 287
Ω s251	—,**methyl-**(*dl*)	Pyrotartaric acid. $HO_2CCH_2CH(CH_3)CO_2H$	132.13	pr	115	d	.....	1.4303	v	v	s	...	...	MeOH v chl δ	**B2**, 637
s252	—,**2-methyl-3-oxo-**,diethyl ester	Diethyl methyloxaloacetate. $C_2H_5O_2CCOCH(CH_3)CO_2C_2H_5$	202.21	.....	.....	137–8[23] 75–8[2]	1.0970_4^{20}	1.4313^{20}	i	∞	∞	...	...	.....	**B3[2]**, 484
Ω s253	—,**methylene-**	Itaconic acid. $CH_2{:}C(CO_2H)CH_2CO_2H$	130.10	rh (bz)	175 (162–4)	d	1.632	.....	s	s	δ	s	δ	chl s peth, CS_2 δ	**B2[2]**, 650
Ω s254	—,—,anhydride	Itaconic anhydride.	112.09	rh bipym pr (eth or chl), sc (aa)	68.5 (70)	139–40[30] 114–5[18]	.....	.....	d[h]	d[h]	δ	...	...	chl v	**B17[2]**, 449
Ω s255	—,—,dichloride	Itaconyl chloride. $CH_2{:}C(COCl)CH_2COCl$	166.99	.....	.....	89[17] 72[2]	.....	1.4919^{20}	d[h]	d[h]	...	s	...	.....	**B2**, 762
s256	—,—,diethyl ester	Diethyl itaconate. $CH_2{:}C(CO_2C_2H_5)CH_2CO_2C_2H_5$	186.21	λ^{al} 265 sh (2.1)	58–9	228 111[13]	1.0467_4^{20}	1.4377^{20}	...	∞	s	v	s	.....	**B2[2]**, 651
Ω s257	—,—,dimethyl ester	Dimethyl itaconate. $CH_2{:}C(CO_2CH_3)CH_2CO_2CH_3$	158.16	hyg mcl (MeOH) λ^{al} 205 (3.88), 240 sh (2.2) λ^{w} 265 (2.25)	38	208[760] 108[11]	1.1241_4^{18}	1.4457^{20}	...	s	s	v	...	MeOH s	**B2**, 762
s258	—,**oxo-**, diethyl ester	Diethyl oxaloacetate. $C_2H_5O_2CCH_2COCO_2C_2H_5$	188.18	.....	.....	131–2[24]	1.1312_4^{20}	1.4561^{17}	i	∞	∞	v	∞	.....	**B3[2]**, 479
s259	—,**2-oxo-3-phenyl-**, 1-ethyl ester 4-nitrile	Ethyl phenylcyanopyruvate. $C_6H_5CH(CN)COCO_2C_2H_5$	217.23	(eth-lig)	130	206[20]	.....	.....	...	v	δ	...	...	chl, alk s	**B10[2]**, 607
s260	—,**phenyl-**(*d*)	$HO_2CCH_2CH(C_6H_5)CO_2H$	194.19	pr (w), $[\alpha]_D^{16.5}$ +148.3 (al, c = 1.5) λ^{al} 260 (2.05)	173–4	.....	.....	.....	δ v[h]	s	v	v	δ	MeOH s	**B9[1]**, 380
Ω s261	—,—(*dl*)	$HO_2CCH_2CH(C_6H_5)CO_2H$	194.19	lf or nd (w) λ^{al} 260 (2.06)	168	d	.....	.....	δ v[h]	v	v	v	i	aa v chl δ CS_2, peth i	**B9[2]**, 619
s262	—,—(*l*)	$HO_2CCH_2CH(C_6H_5)CO_2H$	194.19	$[\alpha]_D^{15}$ −173.3 (ace) λ^{al} 260 (2.06)	173–4	.....	.....	.....	...	v	v	v	i	MeOH s	**B9[1]**, 381
s263	—,—,anhydride(*d*)	.....	176.18	nd (bz-peth), $[\alpha]_D^{15}$ +100.9 (bz) λ^{al} 258 (2.2)	83.5–4.5	.....	.....	.....	d[h]	s	...	...	v	chl v peth, CCl_4 δ	**B17[1]**, 259
s264	—,—,—(*dl*)	$C_{10}H_8O_3$. *See* s263	176.18	mcl pr or nd (eth)	54	204–6[22] 191–2[12]	.....	.....	i	v	s	v	v	oos v	**B17[2]**, 473
s265	—,—,—(*l*)	$C_{10}H_8O_3$. *See* s263	176.18	$[\alpha]_D^{14}$ −100.9 (bz)	83.5–4.5	.....	.....	.....	d[h]	...	...	...	v	chl v	**B17[1]**, 259
s266	—,**(3-phenyl-propenyl)-**	$C_6H_5CH_2CH{:}CHCH(CO_2H)CH_2CO_2H$	234.25	lf (eth), (bz)	112	.....	.....	.....	s	...	v	v	v	.....	**B9**, 909
Ω s267	—,**tetrahydroxy-**	$HO_2CC(OH)_2C(OH)_2CO_2H$	182.09	.....	114–5	.....	.....	.....	d	...	...	...	...	.....	**B3[2]**, 500
s268	—,**tetramethyl-**	$HO_2CC(CH_3)_2C(CH_3)_2CO_2H$	174.20	tcl (60% MeOH, lig or AcOEt), mcl and tcl (eth or ace)	200	sub	1.30	.....	δ	v	...	...	v	chl s	**B2[2]**, 601
s269	—,—,dinitrile	$NCC(CH_3)_2C(CH_3)_2CN$	136.20	mcl pl, lf and pr (dil al)	170.5–1.5	.....	1.070	.....	...	s[h]	...	...	...	.....	**B2[1]**, 290
—	**Succinimide**	*see* **Succinic acid**, imide													
Ω s273	**Sucrose**	Cane sugar. Saccharose.	342.30	mcl, $[\alpha]_D^{20}$ +66.37 (w)	185–6	.....	$1.5805^{17.5}$	1.5376	s v[h]	δ	i	...	...	Py s	**B31**, 424
Ω s274	—,octaacetate	$C_{28}H_{38}O_{19}$. *See* s273	678.61	nd (al), $[\alpha]_D^{20}$ +59.6 (chl)	86–87	d 285 260[1]	1.27^{16}	1.4660	δ[h]	s[h]	s	s	s	chl, oos s	**B31**, 453
s275	**Sudan III**	Tetrazobenzene-β-naphthol.	352.40	br lf with gr lustre (aa) $\lambda^{cellosolve}$ 345 (4.22), 505 (4.49)	195	.....	.....	.....	i	s	s	s	s	xyl, chl, aa, peth s	**B16[2]**, 75
—	**Sudan G**	*see* **Azobenzene, 2,4-dihydroxy-**													
—	**Sudan yellow**	*see* **Azobenzene 1-naphthalene, 2'-hydroxy-**													
Ω s276	**Sulfadiazine**	2-Sulfanilamidopyrimidine. Sulfapyrimidine.	250.28	cr (w), wh pw $\lambda^{0.1N\ HCl}$ 244 (4.15)	255–6d (cor)	.....	.....	.....	δ	δ	...	δ	...	ac s	**C55**, 25956
s277	**Sulfaguanidine**	Sulfoguenil.	214.25	nd (w)	190–3 (anh)	.....	.....	.....	δ s[h]	δ	...	δ	...	dil ac s	**C55**, 22204

For explanations, symbols and abbreviations see beginning of table. For structural formulas see end of table.

PHYSICAL CONSTANTS OF INORGANIC COMPOUNDS (Continued)

No.	Name	Synonyms and Formulae	Mol. wt.	Crystalline form, properties and index of refraction	Density or spec. gravity	Melting point, °C	Boiling point, °C	Solubility, in grams per 100 cc		
								Cold water	Hot water	Other solvents
	Lead									
1139	*di*thionate	$PbS_2O_6.4H_2O$	439.38	trig, 1.635, 1.653	3.22	d		115.0^{20}		
1140	thiosulfate	PbS_2O_3	319.32	wh cr	5.18	d		0.03		s a, $Na_2S_2O_3$
1141	*meta*titanate	$PbTiO_3$	303.09	yel, rhomb-pyr	7.52			i	i	
1142	telluride	Nat. altaite. PbTe	334.79	wh, cub	8.164^{20}_{4}	917				i a
1143	thiocyanate	$Pb(SCN)_2$	323.35	wh, monocl	3.82	d 190		0.05^{20}	0.2^{100}	s KCNS, HNO_3
1144	tungstate	Nat. stolzite. $PbWO_4$	455.04	tetr, 2.269, 2.182	8.23			i		i HNO_3, s KOH
1145	tungstate	Nat. raspite. $PbWO_4$	455.04	col, monocl, 2.27, 2.27, 2.30		1123		0.03		d a; i al
1146	*meta*vanadate	$Pb(VO_3)_2$	405.07	yel powd				sl s		d HCl; s dil HNO_3
1147	**Lithium**	Li	6.939	silver white, soft	0.534^{20}	180.54	1347	d		
1148	acetate	$LiC_2H_3O_2.2H_2O$	102.01	wh, rhomb, α 1.40, β 1.50		70	d	300^{15}	v s	21.5 al
1149	acetylsalicylate	$LiC_9H_7O_4$	186.09	wh powd hygr, d in moist air				100		25 al
1150	*meta*aluminate	$LiAlO_2$ (or $Li_2Al_2O_4$)	65.92	wh, rhomb, 1.604, 1.614	2.55^{25}_{4}	1900–2000		i		
1151	aluminum hydride	$LiAlH_4$	37.95	wh cr powd	0.917	d 125		d		*ca* 30 eth
1152	amide	$LiNH_2$	22.96	col need, cub	$1.178^{17.5}$	380–400	d 750–200 subl	s	d	sl s liq NH_3, al; i eth, bz
1153	antimonide	Li_3Sb	142.57		3.2^{17}	>950		d	d	d a
1154	*ortho*arsenate	Li_3AsO_4	159.74	wh powd, rhomb	3.07^{15}			v sl s		s dil ac a; i pyr
1155	aside	LiN_3	48.96	col cr, hygr		d 115–298		66.41^{16}		20.26^{16} abs al; i eth
1156	benzoate	$LiC_7H_5O_2$	128.06	wh cr or powd				33^{25}	40^{100}	7.7^{25} al, 10^{78} al
1157	*meta*borate	$LiBO_2$	49.75	wh, tricl	$1.397^{41.7}$	845		2.57^{20}	11.83^{80}	
1158	*meta*borate	$LiBO_2.8H_2O$	193.87	col, trig	$1.38^{14.9}$	47				
1159	*penta*borate	$Li_2B_{10}O_{16}.8H_2O$	522.10	wh	1.72	300–350 $-8H_2O$		36.3^{25}	194^{100}	3.9^{20} al; 22^{25} glycerine; i bz
1160	*tetra*borate	$Li_2B_4O_7$	169.11	wh cr		930		2.89^{20}	5.45^{100}	i org solv
1161	borohydrate	$LiBH_4$	21.78	rhomb cr	0.66	d 279		s d		s eth
1162	borohydrate	$LiBH_4$	21.78	wh, orthorhomb	0.666	275 d		v sl s		d al; 2.5 eth
1163	bromide	LiBr	86.85	wh, cub, deliq, 1.784	3.464^{25}	550	1265	145^{4}	254^{90}	73^{40} al; 8 MeOH; s al, eth; sl s pyrid
1164	bromide, dihydrate	$LiBr.2H_2O$	122.28	wh cr		$-1H_2O$; 44		246.0^{20}	v s	s al
1165	carbide	Li_2C_2	37.90	wh cr or powd	1.65^{18}			d	d	s a
1166	carbonate	Li_2CO_3	73.89	wh, monocl, 1.428, 1.567, 1.572	2.11	723	d 1310^{760}	1.54^{0}	0.72^{100}	i al; acet
1167	carbonate, acid	Lithium bicarbonate. $LiHCO_3$	67.96	wh				5.5^{12}		
1168	chlorate	$LiClO_3$	90.39	col, rhomb need, deliq, α 1.63, γ 1.64	1.1190^{18}_{4} (18 %Soln)	127.6	300 d	500^{27}		v s al; 0.142^{25} acetone
1169	chlorate	$LiClO_3.\frac{1}{2}H_2O$ (or $\frac{1}{2}H_2O$)	99.39	wh, tetr, deliq		65(?)	$-\frac{1}{2}H_2O$, 90 d 290	v s	v s	v s al
1170	perchlorate	$LiClO_4$	106.39	wh	2.428	236	430 d	60.0^{25}	150^{99}	152^{25} al; 182^{25} MeOH; 114^{25} eth; 137^{25} acetone
1171	perchlorate, trihydrate	$LiClO_4.3H_2O$	160.44	wh, hex	1.841	95 deliq 236 (anhydr)	d 100 $-2H_2O$	130^{25}		72.9^{25} al; 156^{25} MeOH; 96.2^{25} acetone; 0.096^{25} eth
1172	chloride	LiCl	42.39	wh, cub, 1.662	2.068^{25}	605	1325–1360	63.7^{0}	130^{26}	25.10^{20} al; 42.36^{25} MeOH; 4.11^{25} acetone; $0.538^{25.5}$ NH_4OH
1173	chloride, monohydrate	$LiCl.H_2O$	60.41	wh cr, hygr	1.78	$-H_2O>98$		86.2^{20}	s	s HCl
1174	chloroplatinate	$Li_2PtCl_6.6H_2O$	529.78	or prism		$-6H_2O$, 180		v s	v s	v s al; i eth
1175	bichromate, dihydrate	$Li_2Cr_2O_7.2H_2O$	265.90	orange-red cr, deliq	2.34^{20}	187 d	110 $-2H_2O$	187^{20}	278^{100}	s reacts al
1176	*di*chromate	$Li_2Cr_2O_7.2H_2O$	265.90	blk-brn cr, deliq		$-2H_2O$, 130	d	151^{20}		
1177	citrate	$Li_3C_6H_5O_7.4H_2O$	281.98	col cr or powd, deliq		$-4H_2O$, 105		74.5^{25}	66.7^{100}	sl s al, eth
1178	fluoride	LiF	25.94	wh, cub, 1.3915	2.635^{20}	845	1676	0.27^{18}		i al; s HF
1179	fluosilicate	$Li_2SiF_6.2H_2O$	191.99	wh, monocl, 1.300, 1.296	2.33^{15}	$-2H_2O$, 100	d	73^{17}		s al; i eth, acet
1180	fluosulfonate	$LiSO_3F$	106.00	wh powd		360		v s	s	v s al, eth, acet; i ligorin
1181	formate, monohydrate	$H.COOLi.H_2O$	69.97	wh, rhomb	1.46	$-H_2O$, 94	d 230	27.85^{18}	57.05^{80}	sl s al, acet; i bz
1182	gallium hydride	$LiGaH_4$	80.69	wh cr				d	d	s eth
1183	gallium nitride	$LiGaN_2$	118.55	lt gr powd	3.35	d 800		d	d	s a, alk
1184	*meta*germanate	Li_2GeO_3	134.47	monocl, 1.7	3.53^{21}	1239		0.85^{25}		s a

No.	Name	Synonyms and Formulae	Mol. wt.	Crystalline form, properties and index of refraction	Density or spec. gravity	Melting point, °C	Boiling point, °C	Solubility, in grams per 100 cc		
								Cold water	Hot water	Other solvents
	Lithium									
1185	hydride	LiH	7.95	wh cr	0.82	680		d		v sl s a
1186	hydroxide	LiOH	23.95	wh tetr, 1.464, 1.452	1.46	450	d 924	12.8^{20}	17.5^{100}	sl s al
1187	hydroxide, monohydrate	$LiOH.H_2O$	41.96	wh monocl, 1.460, 1.524	1.51			22.3^{15}	26.8^{20}	sl s al; i eth
1188	iodate	$LiIO_3$	181.84	wh, hex, hygr	$4.502^{\frac{25}{4}}$			80.3^{15}		i al
1189	iodide	LiI	133.84	wh, cub, 1.955 ± 0.003	3.494 ± 0.015	449	1180 ± 10	165^{20}	433^{80}	250.8^{20} al; 42.6^{16} acet 343.4^{20} MeOH; v s NH_4OH
1190	iodide, trihydrate	$LiI.3H_2O$	187.89	col-yelsh, hex, hygr	3.48	$73 - H_2O$	$-2H_2O$, 80 $-H_2O$, 300	151^{0}	201.2^{80}	s abs al, acet
1191	laurate	$LiC_{12}H_{23}O_2$	206.25	wh powd		229.2–229.8		$0.154^{16.5}$	0.178^{25}	0.322^{25} al; $0.008^{16.5}$ eth; 0.240^{25} acet
1192	*permanganate*	$LiMnO_4.3H_2O$	179.92	cub	2.06	d 190		71.43^{15}		d alk
1193	molybdate	Li_2MoO_4	173.82	wh trig, hygr	2.66	705		v s		
1194	myristate	$LiC_{14}H_{27}O_2$	234.31			223.6–224.2		$0.027^{16.5}$ 0.036^{25}	0.062^{80}	$0.010^{16.5}$ eth; 0.331^{15} acet; 0.155^{80} al
1195	nitrate	$LiNO_3$	68.94	wh, trig, 1.735, 1.735	2.38	264	d 600	$89.8^{27.55}$	234^{100}	s NH_4OH, al; 37.15 pyridine
1196	nitrate, trihydrate	$LiNO_3.3H_2O$	122.99	col need		$-2\frac{1}{2}H_2O$, 29.9	$-3H_2O$, 61.1	34.8^{0}	$57.48^{29.6}$	s al, MeOH, acet
1197	nitride	Li_3N	34.82	red-brn amorph, or blk-gray cr, cub		tr 840–850 (in N_2)				
1198	nitrite	$LiNO_2.H_2O$	70.96	col flat need	1.615^{0}	>100	d	125^{0}	459^{60}	v s abs al
1199	oxalate	$Li_2C_2O_4$	101.90	col, rhomb, 1.465, 1.53, 1.696	$2.121^{17.5}$	d		$8^{19.5}$		i al, eth
1200	oxalate, acid	$LiHC_2O_4.H_2O$	113.99			d		8^{17}		
1201	oxide	Li_2O	29.88	wh cr, cub, n_D 1.644	$2.013^{25.2}$	>1700	1200^{760}	6.67° d	10.02^{100}	
1202	palmitate	$LiC_{16}H_{31}O_2$	262.36	wh powd		224.5		0.01^{15}	0.015^{25}	0.347^{15} acet; 0.077^{20} al; $0.005^{15.5}$ eth
1203	*meta*phosphate	$LiPO_3$	85.91	col pl	2.461	red heat		i	i	s a
1204	*ortho*phosphate	Li_3PO_4	115.79	col, rhomb	$2.537^{17.5}$	837		0.039^{15}		s a, NH_4OH; i acet
1205	*ortho*phosphate	$Li_3PO_4.\frac{1}{2}H_2O$	124.80	wh cr powd	2.41	$-\frac{1}{2}H_2O$, 100		0.04^{25}		s a
1206	phosphate, di- H	LiH_2PO_4	103.93	col cr, hygr	2.461	>100				
1207	potassium sulfate	$LiKSO_4$	142.10	col, hex; n_D 1.4723, 1.4717	2.393^{20}			s	s	
1208	potassium *dl*-tartrate	$LiKC_4H_4O_6.H_2O$	212.13	col, monocl, β 1.523 (red)	1.610			s		
1209	salicylate	$LiC_7H_5O_3$	144.06	wh, powd, deliq		d		133.3		50 al
1210	selenide	$Li_2Se.9H_2O$	254.98	col, rhomb, deliq				d		
1211	*meta*silicate	Li_2SiO_3	89.96	col, rhomb; α 1.584, γ 1.604	2.52^{25}_{4}	1204		i	s d	s dil HCl
1212	*ortho*silicate	Li_4SiO_4	119.84	col, rhomb; α 1.594, γ 1.614	2.392^{25}_{4}	1256		i	d	d a
1213	silicide	Li_6Si_2	97.81	bl cr, hygr	ca. 1.12	d 600 (vac)		d	d	d a; i NH_3 turp
1214	sodium fluoaluminate	$Li_3Na_3(AlF_6)_2$	371.73	cub cr, 1.3395	2.774	710		0.074^{15}		
1215	stearate	$LiC_{18}H_{35}O_2$	290.41	wh cr		220.5–221.5		0.010^{15}		0.010^{25} al; 0.040^{15} eth; 0.457^{15} acet
1216	sulfate	Li_2SO_4	109.94	α monocl; β hex or rhomb, γ cub 500°C; β 1.465	2.221	845		26.1^{0}	23^{100}	i abs al, acet
1217	sulfate, hydrogen	$LiHSO_4$	104.01	col pr	2.123^{12}	120		d		
1218	sulfate, monohydrate	$Li_2SO_4.H_2O$	127.95	col cr, monocl, 1.465, 1.477, 1.488		880		34.9^{23}	29.2^{100}	11.5^{20} al + H_2O (23.9 % alco); i acet, pryidine
1219	sulfide	Li_2S	45.94	wh-yel, cub, deliq	1.66	900–975		v s	v s	v s al
1220	sulfide, hydro-	LiHS	40.01	wh powd, hygr				s	s	s al
1221	sulfite, monohydrate	$Li_2SO_3.H_2O$	111.96	wh need, α 1.53, γ 1.59		455 d	140 $-H_2O$	24.9^{20}	22^{80}	i org solv
1222	tartrate	$Li_2C_4H_4O_6.H_2O$	179.97	wh cr powd				s		
1223	thallium *dl*-tartrate	$LiTlC_4H_4O_6.2H_2O$	395.41	tricl	3.144					
1224	thiocyanate	LiSCN	65.02	wh cr, deliq, n_D 1.333				v s		s methylacet
1225	*di*thionate	$Li_2S_2O_6.2H_2O$	210.03	col, rhomb, 1.5602	2.158	d		v s		
1226	tungstate	Li_2WO_4	261.73	col, trig	3.71	742		v s	v s	d a; i al
1227	**Lutetium**	Cassiopeium, Lu	174.97	met, hex	9.8404	1663	3395			

No.	Name	Synonyms and Formulae	Mol. wt.	Crystalline form, properties and index of refraction	Density or spec. gravity	Melting point, °C	Boiling point, °C	Solubility, in grams per 100 cc		
								Cold water	Hot water	Other solvents
	Ytterbium									
y4	(III) bromide	$YbBr_3$	412.77	col cr		956	d	s	s	
y5	(II) chloride	$YbCl_3$	243.95	grn-yel cr	5.08	702	1900	s	s	s dil a
y6	(III) chloride	$YbCl_3.6H_2O$	387.49	grn, rhomb cr, deliq	2.575	865 $-6H_2O$, 180		v s	v s	s abs al
y7	(II) fluoride	YbF_2	211.04			1052	2380	i	i	
y8	fluoride	YbF_3	230.04			1157	2200	i	i	i dil a
y9	(II) iodide	YbI_2	426.85	lt yel, hex cr	5.40^{25}_{4}	780 ± 4	1300 d(700) vac	s	s	s dil a
y10	(III) iodide	YbI_3	553.75	gold yel cr		d 700	d	s	s	s dil a
y11	(III) oxalate	$Yb_2(C_2O_4)_3.10H_2O$	790.29	col cr	2.644			0.00033^{25}		sl s dil a
y12	(III) oxide	Ytterbia. Yb_2O_3	394.08	col	9.17			i	i	s h dil a
y13	(III) selenate	$Yb_2(SeO_4)_3.8H_2O$	919.08	hex pl	3.30			s d	s	
y14	(III) selenite	$Yb_2(SeO_3)_3$	726.95					i		
y15	(III) sulfate	$Yb_2(SO_4)_3$	634.26	col cr	3.793	d 900		44.2^{0}	4.7^{100}	
y16	(III) sulfate, octohydrate	$Yb_2(SO_4)_3.8H_2O$	778.39	prism	3.286			35.9^{25}	21.1^{40}	
y17	**Yttrium**	Y	88.905	gray-blk met, hex	4.4689	1522	3338	sl d	d	v s dil a; s h KOH
y18	acetate	$Y(C_2H_3O_2)_3.4H_2O$	338.10	col, tricl					9.03^{25}	
y19	bromate	$Y(BrO_3)_3.9H_2O$	634.76	hex pr		74	$-6H_2O$, 100	168^{25}		sl s al; i eth
y20	bromide	YBr_3	328.63	deliq		904		v s		s al; i eth
y21	bromide hydrate	$YBr_3.9H_2O$	490.77	col tabl, deliq				v s		sl s al; i eth
y22	carbide	YC_2	112.93	yel., microcr	4.13^{15}			d		
y23	carbonate	$Y_2(CO_3)_3.3H_2O$	411.88	wh-redsh powd						s dil min a, $(NH_4)_2CO_3$; sl s aq CO_2; i al, eth
y24	chloride	YCl_3	195.26	shiny wh leaf	2.67	721	1507	78^{10}	82^{50}	60.1^{15} al; 60.6^{15} pyr
y25	chloride, hexahydrate	$YCl_3.6H_2O$	303.36	redsh-wh, rhomb, deliq	2.18^{15}	$-5H_2O$, 100		217^{20}	235^{40}	s al; i eth
y26	chloride, monohydrate	$YCl_3.H_2O$	213.28	col cr		$-H_2O$, 160		v s		
y27	fluoride	YF_3	145.90	gelat	4.01	1387		i		v sl s dil a
y28	hydroxide	$Y(OH)_3$	139.93	wh-yel gelat or powd		d		i	i	s a, NH_4Cl; i alk
y29	iodide	YI_3	469.62	wh, cr, deliq		1004	$650–700^{0.05}$	v s		s al, acet; sl s eth
y30	molybdate	$Y_2(MoO_4)_3.4H_2O$	729.68	grayish or yelsh, tetr pl, 2.03	4.79^{10}_{10}	1347				
y31	nitrate, hexahydrate	$Y(NO_3)_3.6H_2O$	383.01	col, redsh cr, deliq	2.68	$-3H_2O$, 100		$134.7^{22.5}$		v s al, eth, HNO_3
y32	nitrate, tetrahydrate	$Y(NO_3)_3.4H_2O$	346.98	redsh-wh pr	2.682			s		s al, HNO_3
y33	oxalate	$Y_2(C_2O_4)_3.9H_2O$	604.01	wh cr powd		d		0.0001		sl s HCl
y34	oxide	Yttria. Y_2O_3	225.81	col-yelsh, cub or powd	5.01	2410		0.00018^{29}		s a; i alk
y35	sulfate	$Y_2(SO_4)_3$	465.99	wh powd	2.52	d 1000		5.38^{25}	s	s sat K_2SO_4 sol
y36	sulfate, octahydrate	$Y_2(SO_4)_3.8H_2O$	610.12	col-redsh, monocl, 1.543, 1.549, 1.576	2.558	$-8H_2O$, 120	d 700	7.47^{16} (anhydr)	1.99^{96} (anhydr)	i al, alk; s conc H_2SO_4
y37	sulfide	Y_2S_3	273.99	yel-gr powd						d a
y38	**Yttrium hexaantipyrine** perchlorate	$[Y(C_{11}H_{11}N_2O)_4](ClO_4)_3$	1516.60	col, hex cr		d 293–296		0.55^{20}		
y39	hexaantipyrine iodide	$[Y(C_{11}H_{11}N_2O)_4]I_3$	1598.96	col cr		280–282		4.65^{20}		
z1	**Zinc**	Zn	65.38	bluish-wh met, hex	7.14	419.58	907	i	i	s a, alk, ac a
z2	acetate	$Zn(C_2H_3O_2)_2$	183.46	col, monocl	1.84	d 200	subl vac	30^{20}	44.6^{100}	2.8^{25} al; 166.79^{70} al
z3	acetate, dihydrate	$Zn(C_2H_3O_2)_2.2H_2O$	219.49	col, monocl, β 1.494	1.735	237	$-2H_2O$, 100	31.1^{20}	66.6^{100}	2 al
z4	acetylacetonate	$Zn(C_5H_7O_2)_2$	263.59	need		138	subl	v s d		v s bz, acet; s al
z5	aluminate	Nat. gahnite. $ZnAl_2O_4$	183.33	cub, grn 1.78	4.58			i	i	i a; sl s alk
z6	amide	$Zn(NH_2)_2$	97.42	wh powd, amorph	2.13^{25}	d 200 vac		d	d	i al, eth
z7	antimonide	Zn_3Sb_2	439.61	silv wh, rhomb pr	6.33	570		d		
z8	*ortho*arsenate	Nat. koettigite. $Zn_3(AsO_4)_2.8H_2O$	618.08	monocl, 1.662, 1.683, 1.717	3.309^{15}	$-1H_2O$, 100		i	i	s HNO_3, H_3PO_4, alk
z9	*ortho*arsenate, basic	Nat. adamite. $Zn_3(AsO_4)_2.Zn(OH)_2$	573.34	col, rhomb	4.475^{15}	d 250				
z10	*ortho*arsenate, hydrogen	$ZnHAsO_4.4H_2O$	277.36	wh, rhomb		$-H_2O$, 327		d	d	
z11	arsenide	Zn_3As_2	345.95	met-gray, tetr	5.528	1015		i		d a
z12	benzoate	$Zn(C_7H_5O_2)_2$	307.60	wh powd				2.46^{20}	1.44^{20}	
z13	borate	$3ZnO.2B_2O_3$	383.35	wh tricl cr, or amorph powd	cr 4.22 powd 3.64	980		s		cr i HCl; amorph; s HCl
z14	bromate	$Zn(BrO_3)_2.6H_2O$	429.28	wh, cub, 1.5452	2.566	100	$-6H_2O$, 200	v s	∞	
z15	bromide	$ZnBr_2$	225.19	col, rhomb, hygr n_D^{15} 1.5452	4.201^{25}_{4}	394	650	447^{20}	675^{100}	v s al, eth, acet; s NH_4OH

No.	Name	Synonyms and Formulae	Mol. wt.	Crystalline form, properties and index of refraction	Density or spec. gravity	Melting point, °C	Boiling point, °C	Solubility, in grams per 100 cc		
								Cold water	Hot water	Other solvents
	Zinc									
z16	butyrate	$Zn(C_4H_7O_2)_2.2H_2O$	275.60	wh pr				10.7^{16}	d	
z17	caproate	$Zn(C_6H_{11}O_2)_2$	295.68					$1.03^{24.5}$		
z18	carbonate	Nat. smithsonite. $ZnCO_3$	125.39	col, trig, 1.818, 1.618	4.398	$-CO_2$, 300		0.001^{18}		s a, alk, NH_4 salts; i NH_3, acet, pyr
z19	chlorate	$Zn(ClO_3)_2.4H_2O$	304.33	col yelsh, cub, deliq	2.15	d 60	d	262^{20}	v s	167 al; s acet, eth, glyc
z20	chlorate, per-	$Zn(ClO_4)_2.6H_2O$	372.36	wh, rhomb, deliq, 1.508, 1.480	2.252 ± 0.01	105–107	d 200	s		s al
z21	chloride	$ZnCl_2$	136.28	wh, hex, deliq, 1.681, 1.713	2.91^{25}	283	732	432^{25}	615^{100}	$100^{12.5}$ al; v s eth; i NH_3
z22	chloroplatinate	$ZnPtCl_6.6H_2O$	581.27	yel, trig, hygr	2.717^{12}	d 160		v s	v s	v s al; d H_2SO_4
z23	chromate	$ZnCrO_4$	181.36	lem-yel pr	3.40			i	d	s a, liq NH_3; i acet
z24	chromate	$ZnCr_2O_4$	233.36	dk grn to black, cub	5.30^{15}					
z25	*di*chromate	$ZnCr_2O_7.3H_2O$	335.40	redsh-brn cr, or or-yel powd, hygr				v s	d	i al, eth; s a
z26	citrate	$Zn_3(C_6H_5O_7)_2.2H_2O$	610.35					sl s		
z27	cyanide	$Zn(CN)_2$	117.41	col, rhomb	1.852	d 800		0.0005^{20}		s alk, KCN, NH_3; i al
z28	ferrate (III)	Ferrite. $ZnFe_2O_4$	241.06	blk, oct	5.33^{20}	1590				s conc HCl; i dil a, alk
z29	ferrocyanide	$Zn_2Fe(CN)_6$	342.69	wh powd	1.85_4^{25}			i		s excess alk; i dil a
z30	ferrocyanide, trihydrate	$Zn_2Fe(CN)_6.3H_2O$	396.74	wh powd		d		i	i	i al, HCl; d NaOH; s NH_4OH; v sl s NH_3
z31	fluoride	ZnF_2	103.37	col, monocl or tricl	4.95_4^{25}	872	*ca* 1500	1.62^{20}	s	s hot a, NH_4OH; i al, NH_3
z32	fluoride, tetrahydrate	$ZnF_2.4H_2O$	175.43	col, rhomb	2.255	$-4H_2O$, 100	tr to ZNO, 3000	1.6^{18}	s	s a, alk, NH_4OH
z33	fluosilicate	$ZnSiF_6.6H_2O$	315.54	col, hex pr, 1.3824, 1.3956	2.104	d 100		v s		
z34	formaldehyde-sulfoxylate	$Zn(HSO_2.CH_2O)_2$	255.56	rhomb pr		d		v s	v s	d a; i al
z35	formaldehyde-sulfoxylate, basic	$Zn(OH)HSO_2.CH_2O$	177.47	rhomb pr		d		i	i	d a; i al
z36	formate	$Zn(CHO_2)_2$	155.41	col, cr	2.368	d		3.80	62^{100}	
z37	formate	$Zn(CHO)_2.2H_2O$	191.44	wh, monocl, 1.513, 1.526, 1.566	2.207^{20}	$-2H_2O$, 140	d	5.2^{20}	38^{100}	i al
z38	gallate	$ZnGa_2O_4$	268.81	wh fine cr, 1.74	6.15 calc	<800		i	i	i org solv; s dil a, NH_4OH
z39	glycerophosphate	$ZnC_3H_7O_6P$	235.43	wh amorph powd				s		i al, eth
z40	hydroxide(c)	$Zn(OH)_2$	99.38	col, rhomb	3.053	d 125		v sl s		s a, alk
z41	iodate	$Zn(IO_3)_2$	415.18	wh, need	5.0632^{25}	d		0.87	1.31	s alk, HNO_3
z42	iodate, dihydrate	$Zn(IO_3)_2.2H_2O$	451.21	wh, cr powd	4.223_4^{25}	$-H_2O$, 200		0.877	1.32	s HNO_3, NH_4OH
z43	iodide	ZnI_2	319.18	col, hexag	4.7364_4^{25}	446	d 624	432^{18}	511^{100}	s a, al, eth, NH_3, $(NH_4)_2CO_3$
z44	*d*-lactate	$Zn(C_3H_5O_3)_2.2H_2O$	279.45					5.7^{15}	9^{32}	0.104 h 98 % al
z45	*dl*-lactate	$Zn(C_3H_5O_3)_2.3H_2O$	297.47	wh, rhomb cr				1.67^{105}	16.7^{100}	v sl s al
z46	laurate	$Zn(C_{12}H_{23}O_2)_2$	464.00	wh powd		128		0.01^{15}	0.019^{100}	0.010^{15} al
z47	*per*manganate	$Zn(MnO_4)_2.6H_2O$	411.33	vlt-br or bl, deliq	2.47	$-5H_2O$, 100		33.3	v s	d al, a
z48	nitrate, trihydrate	$Zn(NO_3)_2.3H_2O$	243.43	col, need		45.5		327.3^{40}		
z49	nitrate, hexahydrate	$Zn(NO_3)_2.6H_2O$	297.47	col, tetrag	2.065^{14}	36.4	$-6H_2O$, 105–131	184.3^{20}	∞	v s al
z50	nitride	Zn_3N_2	224.12	gray	6.22_4^{25}			d		s HCl
z51	oleate	$Zn(C_{18}H_{33}O_2)_2$	628.30	wax-like solid		70		i		s al, eth, bz, CS_2; sl s acet
z52	oxalate	$ZnC_2O_4.2H_2O$	189.42	wh powd	3.28_4^{25}	d 100		0.00079^{18}		s a, alk
z53	oxide	Nat. zincite. ZnO	81.37	wh, hex, 2.008, 2.029	5.606	1975		0.00016^{29}		s a, alk, NH_4Cl; i al, NH_3
z54	oxide, per-	$ZnO_2.\frac{1}{2}H_2O$	106.38	yelsh, powd	3.00 ± 0.08	$-O_2$, vac		sl d	d	d al, eth, acet
z55	1-phenol-4-sulfonate(p)	$Zn(C_6H_5SO_4)_2.8H_2O$	555.83	col cr or fine wh powd, effl		$-8H_2O$, 125		62.5	250^{100}	55.6^{25} al
z56	*ortho*phosphate	$Zn_3(PO_4)_2$	386.05	col, rhomb	3.998^{15}	900		i	i	s a, NH_4OH; i al
z57	*ortho*phosphate, dihydrogen	$Zn(H_2PO_4)_2.2H_2O$	295.38	tricl		d 100		d		
z58	*ortho*phosphate, octahydrate	$Zn_3(PO_4)_2.8H_2O$	530.18	rhomb pl	3.109^{15}			i		s alk